ArcSine engineering

Featured Project

NASA Ames Research Center
20-MW Power Supply Upgrade

Moffett Field, California

The NASA-Ames Arc Jet Complex located in Moffett Field, California, has provided over 40 years of thermal protection system testing for every NASA space transportation vehicle. The Complex consists of seven test bays, two dc power supplies, steam vaccuum, cooling and gas systems. Test bays vary in physical characteristics (size, gas, power, nozzle exit, mach number, pressure, and heating) to accommodate a wide variety of models. Premixed air, heated to extreme temperature by a high-powered dc discharge, expands through user-selected conical, semi-elliptical, and channel nozzles to hypersonic velocities with enthalpies similar to those experienced by an atmospheric re-entry vehicle.

ArcSine Engineering was the design engineer and contractor for the removal, rewind, and reinstallation and commission of a saturable reactor and transformer pair, one power system of five module sets which are part of the 20-MW power supply. The 20-MW dc power serves the aerodynamic heating facility (AHF), Turbulent Flowduct (2 x 9), and the Panel Test Facility (PTF). The saturable reactor (one of five) is 6,900V, 1,810kVA, 3-phase, with a bias supply control of 125V dc. The saturable reactor feeds a transformer with Delta and Wye secondaries, each fed through dc rectifiers and dc filters, and are terminated on a common dc setup switch. The setup switch enables multiple series/parallel combinations of all five or fewer modules, with up to five Delta/Wye outputs.

ArcSine Engineering performed the following:

- Field investigation.
- Drawing development.
- Removal of reactor and transformer.
- Disassembly, assessment, rewind, rebuild.
- Factory Acceptance Test.
- Lift and installation of reactor/transformer.
- Field testing; Doble, Megger, and turn-to-turn ratio (TTR) test.

In addition, ArcSine Engineering was also responsible for:

- Field wiring.
- Performance test including dc resistance.
- Sequence testing.
- Arc run.

**Field Investigation
Power Distribution**